



# Applications, Products and Solutions

## Ventilation Management Systems for Underground Mines

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# About Conspec Controls Ltd.

Providing Gas Detection & Process  
Control Solutions for Mining since 1968

100% Canadian Owned

ISO 9001:2008 Certified by UL-DQS

# About

## Conspec Controls

Corporate Headquarters in Burlington,  
Ontario, Canada

Manufacturing, Service and Product  
Development Facilities in Toronto,  
Ontario; Charleroi, Pennsylvania; Denver,  
Colorado; Sydney, Australia & Beijing,  
China

# About Conspec Controls

Early Developer of Atmospheric Monitoring, Process Control and Ventilation on Demand/Ventilation Management Solutions for Mining since the 1970s

Atmospheric Monitoring and Process Control Solutions Installed in over 150 Mines Worldwide

# Why install a mine wide Ventilation Management System

- 1) Health and Safety
- 2) Reduction of Energy Costs
- 3) Reduction of Production Costs

# Conspec Ventilation Management

Integrates real-time monitoring data from atmospheric sensors, louver and fan controls into a SCADA system to provide accurate and timely ventilation management

# Conspec Ventilation Management System

- 1) Health and Safety Improvements
  - a) Accurate monitoring of airborne contaminants in real time
  - b) Adjusts ventilation to improve airflow to contaminated areas
  - c) Greater accuracy in ventilation needs versus simulated models
  - d) Reduction in risk of fire

# Conspec Ventilation Management System

## 2) Reduction of Energy Costs

- a) Uses actual environmental needs to target ventilation strategically
- b) Significant reduction in energy costs versus constant maximum ventilation mine-wide
- c) Reduction in energy loads at peak times for ventilation



# Conspec Ventilation Management System

- 2) Reduction of Production Costs
  - a) Monitoring of fan operating parameters (speed, voltage, current) to prevent breakdowns and plan maintenance
  - b) Reduces time to return to work post blast by accurately monitoring for atmospheric contaminants from the surface

# Conspec Ventilation Management Components

- 1) Smart Head Controllers and Sensors for atmospheric monitoring
- 2) Multi-function I/O Controllers for fan and louver controls
- 3) Senturion SCADA for sequencing based on real time data
- 4) Optional tracking

# Monitoring System Overview



# Monitoring System Overview

Comes in Two Parts:

- 1) T1200 Smart Head Controller
- 2) Smart Head Sensors – gases, air velocity, weather station, 3<sup>rd</sup> party analog sensor interfaces

# Key Benefits

- 1) Reduces equipment redundancy
- 2) Digitized sensor readings
- 3) Temperature compensated sensor readings
- 4) Intelligent plug and play sensors
- 5) Continuous operational status monitoring

# Monitoring System Overview

- 6) 3 User configurable alarms per attached Sensor
- 7) Uses Industry Standard MODBUS protocol
- 8) Easy to use on-board menus on large LCD display
- 9) Remotely configurable via Conspec device interface software

# Sensors

Supports several gas sensing technologies

- 1) Electrochemical (toxic gases & oxygen)
- 2) Infra-red (combustibles & CO<sub>2</sub>)
- 3) Catalytic Bead (combustibles)
- 4) UV Photo-Ionization (volatile organic compounds & some toxic gases)



# Sensors

Supports several atmospheric sensing technologies

1) Air velocity (-15.0m/s to 15.0m/s)

No moving parts

Immune to changes in altitude

High immunity to dust & water ingress

Minimal calibration needed



# Sensors

Supports Several Atmospheric Sensing Technologies:

## 2) Mini-Weather Station

(dry & wet bulb temperature, humidity, barometric pressure)

High immunity to dust & water ingress

Minimal calibration needed

# Sensors

Supports several atmospheric sensing technologies

3) Smoke, Dust, Diesel Particulate Matter  
coming soon

# Sensors

Supports several analog inputs to digitize the sensor signal and monitor 3<sup>rd</sup> party devices and sensors:

- 1) 4~20mA
- 2) 0-5VDC
- 3) 0-3.8VDC

# Conspec/Newtrax Minetrax Network Gas Transmitter

- 1) Uses the same Smart Head Sensor technology as the Conspec fixed Smart Head Monitoring System in a battery powered wireless gas transmitter.
- 2) Operates for over 45 days on a special industrial grade D-cell sized battery.

# T1008, T1034, T1039, T1274 Multi-Function I/O Controllers

- 1) Provides local device and systems monitoring & control
- 2) Significantly lower cost than PLCs
- 3) Industry Standard MODBUS protocol

# T1008, T1034, T1039, T1274 Multi-Function I/O Controllers

- 4) Can be factory preprogrammed or run “on the fly” via scripts from the Conspec Senturion series SCADA using conditional and/or timed sequences
- 5) Ideal for use with ventilation fans, pumps and louvers

# T1008

## Multi-Function I/O Controller

### Includes:

- 1) 8 Digital Inputs
- 2) 8 Digital Outputs
- 3) 4 Analog Inputs (0-5VDC or 4~20mA)
- 4) 1 Pulse Accumulator Frequency Input
- 5) 1 Pulse Accumulator Event Counter Input

# T1034

## Multi-Function I/O Controller

Includes:

- 1) 4 Digital Inputs
- 2) 4 Digital Outputs
- 3) 4 Analog Inputs (0-5VDC or 4~20mA)



# T1039

## Multi-Function I/O Controller

Includes:

- 1) 8 Digital Inputs
- 2) 8 Digital Outputs
- 3) 1 Pulse Accumulator Frequency Input
- 4) 1 Pulse Accumulator Event Counter Input

# T1274

## Multi-Function I/O Controller

Includes:

- 1) 5 Digital Inputs
- 2) 4 Digital Outputs
- 3) 1 Analog Inputs (0.3.8VDC, 0-5VDC or 4~20mA)

# SCADA Software System

- 1) Advanced modular and scalable monitoring and SCADA control system specifically designed for the needs of the underground mining industry
- 2) Connects all Conspec and third party environmental monitors, transmitters, controllers and field devices

## SCADA Software System

- 3) Connect to devices through existing mine communications infrastructure
- 4) OPC infrastructure for easy connectivity to existing systems
- 5) Easily script and implement timed and condition based control sequences for alarming and equipment control

# SCADA Software System

- 6) Easily synchronize equipment for maximum efficiency
- 7) Easily identify faulty equipment for speedy maintenance
- 8) Easily schedule preventative maintenance for key equipment

# SCADA Software System

- 9) Scalable – up to 25,000 points on 32 different trunks
- 10) Can be integrated to other systems within an underground mining operation to become a full mine plant management system

# SCADA Software System

2 Versions:

- 1) Windows edition for smaller operations
- 2) UNIX/Windows multi-server version for larger operations



# SCADA Software System

Windows Edition includes:

- 1) Single Computer Hosting both Windows “System Primary” I/O controllers and Windows based System Server featuring SQL & OPC architecture
- 2) Optional Windows/Silverlight based web server for remote monitoring



# SCADA Software System

UNIX/Windows Multi Server Edition includes:

- 1) Dedicated UNIX based “System Primary” I/O controllers
- 2) Windows based System Server featuring SQL & OPC architecture
- 3) Optional Windows/Silverlight based web server for remote monitoring

# SCADA Software System

Both Editions include:

- 1) Windows Terminal Program for full user-controlled access and control (limited licenses on Windows Edition/unlimited licenses on UNIX/Windows Edition)
- 2) System's Graphics Terminal for Graphical Editing

# SCADA Software System

## Additional Features:

- 1) Live Trending of current readings
- 2) Historical Trending for advanced analysis and reporting
- 3) Extensive library of pre-configured reports
- 4) Graphical Interface for ease of configuration



# SCADA Software System

Optional integration of Conspec or third party tracking system through OPC for greater accuracy and safety



CONSPEC®

Innovation that digs deeper.

Thank  
You

